1. General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in a SOD128 small and flat lead Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Average forward current: I_{F(AV)} ≤ 3 A
- Reverse voltage: V_R ≤ 30 V
- Low forward voltage
- High power capability due to clip-bond technology
- AEC-Q101 qualified
- Small and flat lead SMD plastic package
- Capable for reflow and wave soldering

3. Applications

- Low voltage rectification
- · High efficiency DC-to-DC conversion
- Switch Mode Power Supply (SMPS)
- · Reverse polarity protection
- Low power consumption applications

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
I _{F(AV)}	average forward current	δ = 0.5 ; f = 20 kHz; $T_{amb} \le 85$ °C; square wave	[1]	-	-	3	А
		δ = 0.5 ; f = 20 kHz; $T_{sp} \le 140$ °C; square wave		-	-	3	А
V_R	reverse voltage	T _j = 25 °C		-	-	30	V
V _F	forward voltage	I _F = 3 A; T _j = 25 °C		-	315	360	mV
I _R	reverse current	V _R = 30 V; T _j = 25 °C		-	1.5	5	mA

[1] Device mounted on a ceramic PCB, Al₂O₃, standard footprint.



3 A low VF MEGA Schottky barrier rectifier

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode[1]		к . Д
2	Α	anode	1 2 CFP5 (SOD128)	sym001

^[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMEG3030EP	CFP5	plastic, surface mounted package; 2 terminals; 4 mm pitch; 3.8 mm x 2.6 mm x 1 mm body	SOD128

7. Marking

Table 4. Marking codes

Type number	Marking code
PMEG3030EP	A5

3 A low VF MEGA Schottky barrier rectifier

8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
V_R	reverse voltage	T _j = 25 °C		-	30	V
I _{F(AV)}	average forward current	δ = 0.5 ; f = 20 kHz; $T_{amb} \le 85$ °C; square wave	[1]	-	3	Α
		δ = 0.5 ; f = 20 kHz; $T_{sp} \le 140$ °C; square wave		-	3	Α
I _{FSM}	non-repetitive peak forward current	t_p = 8 ms; square wave; $T_{j(init)}$ = 25 °C		-	50	Α
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[2]	-	0.625	W
			[3]	-	1.05	W
			[4]	-	2.1	W
Tj	junction temperature			-	150	°C
T _{amb}	ambient temperature			-55	150	°C
T _{stg}	storage temperature			-65	150	°C

- Device mounted on a ceramic PCB, Al_2O_3 , standard footprint.
- Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

 Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm².
- Device mounted on a ceramic Printed-Circuit Board (PCB), Al₂O₃, standard footprint.

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
f	thermal resistance from junction to ambient		[1] [2]	-	-	200	K/W
			[1] [3]	-	-	120	K/W
			[1] [4]	-	-	60	K/W
R _{th(j-sp)}	thermal resistance from junction to solder point		[5]	-	-	12	K/W

For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses P_R are a significant part of the total power losses.

Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm². [3]

Device mounted on a ceramic PCB, Al₂O₃, standard footprint.

Soldering point of cathode tab. [5]

3 A low VF MEGA Schottky barrier rectifier

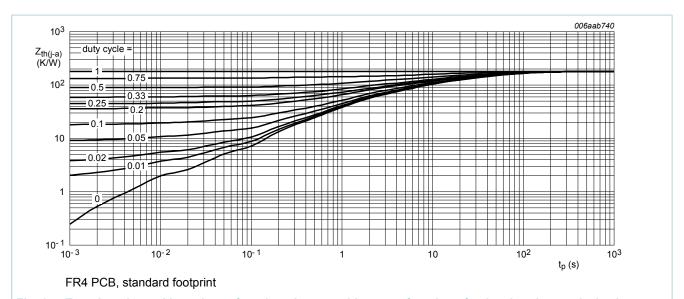


Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

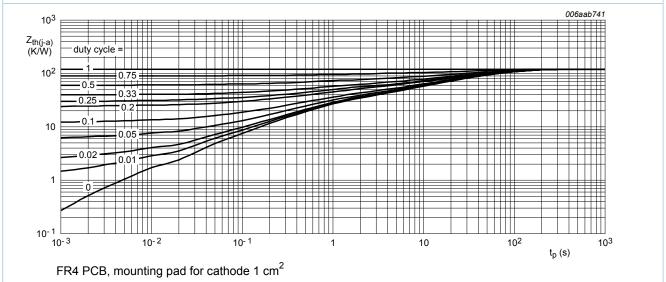
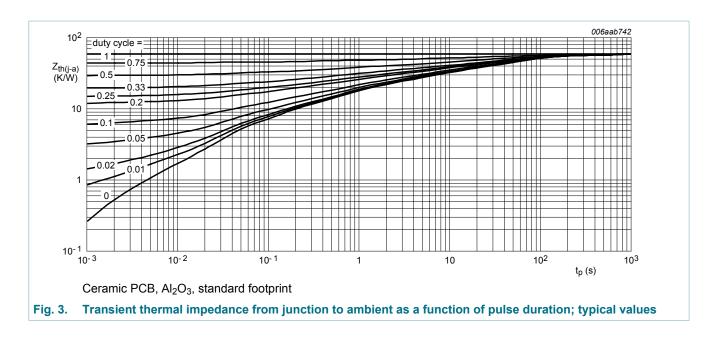


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

3 A low VF MEGA Schottky barrier rectifier



10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V _F	forward voltage	I _F = 0.5 A; T _j = 25 °C	-	235	270	mV
		I _F = 1 A; T _j = 25 °C	-	260	290	mV
		I _F = 3 A; T _j = 25 °C	-	315	360	mV
I _R	reverse current	V _R = 5 V; T _j = 25 °C	-	190	-	μA
		V _R = 30 V; T _j = 25 °C	-	1.5	5	mA
C _d	diode capacitance	V _R = 1 V; f = 1 MHz; T _j = 25 °C	-	470	-	pF
		V _R = 10 V; f = 1 MHz; T _j = 25 °C	-	160	-	pF

3 A low VF MEGA Schottky barrier rectifier

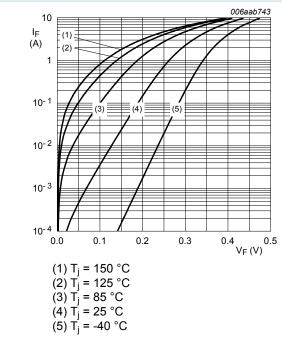


Fig. 4. Forward current as a function of forward voltage; typical values

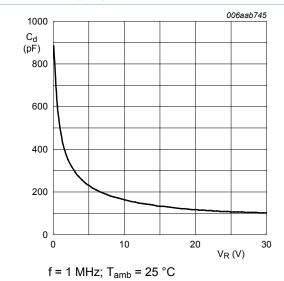


Fig. 6. Diode capacitance as a function of reverse voltage; typical values

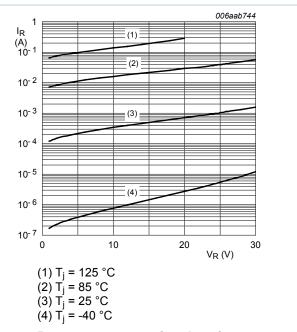
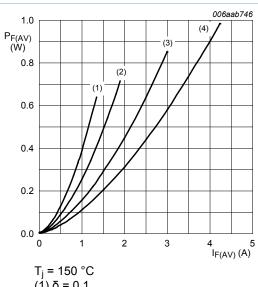


Fig. 5. Reverse current as a function of reverse voltage; typical values



 $T_j = 150 \,^{\circ}\text{C}$ (1) $\delta = 0.1$ (2) $\delta = 0.2$ (3) $\delta = 0.5$ (4) $\delta = 1$

Fig. 7. Average forward power dissipation as a function of average forward current; typical values

4.5

3.0

I_{F(AV)} (A)

(1)

(2)

3 A low VF MEGA Schottky barrier rectifier

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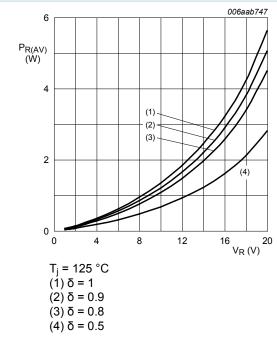
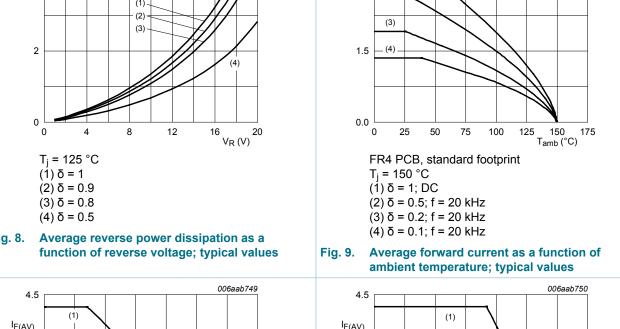


Fig. 8.



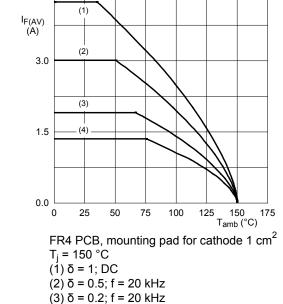


Fig. 10. Average forward current as a function of ambient temperature; typical values

(4) $\delta = 0.1$; f = 20 kHz

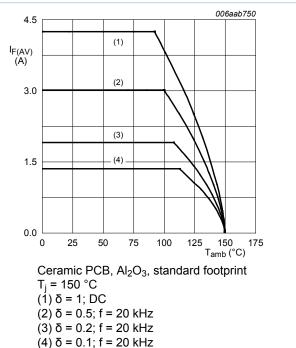
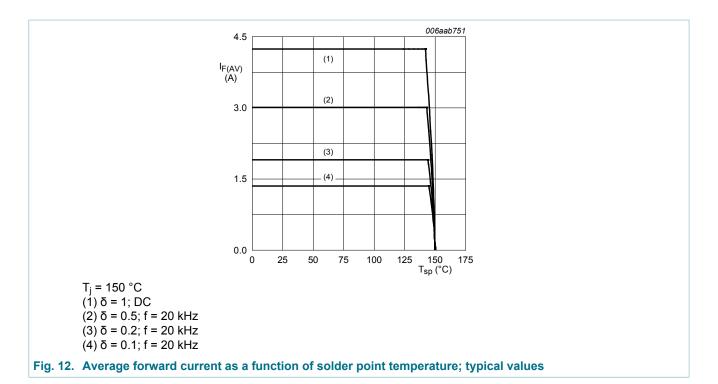
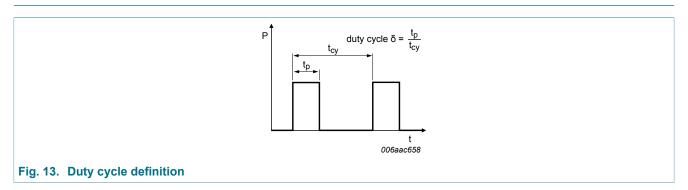


Fig. 11. Average forward current as a function of ambient temperature; typical values

3 A low VF MEGA Schottky barrier rectifier



11. Test information



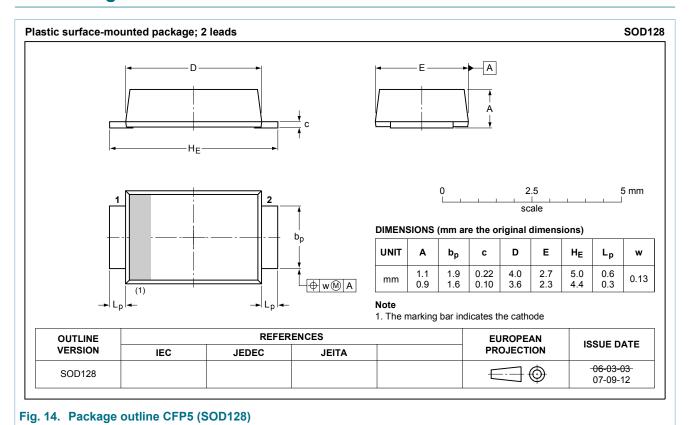
The current ratings for the typical waveforms are calculated according to the equations: $I_{F(AV)} = I_M \times \delta$ with I_M defined as peak current, $I_{RMS} = I_{F(AV)}$ at DC, and $I_{RMS} = I_M \times \sqrt{\delta}$ with I_{RMS} defined as RMS current.

Quality information

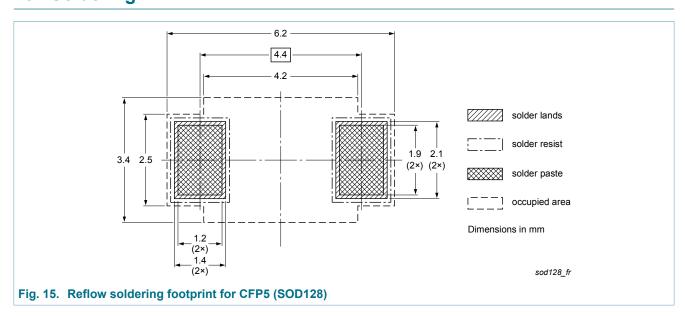
This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - Stress test qualification for discrete semiconductors, and is suitable for use in automotive applications.

3 A low VF MEGA Schottky barrier rectifier

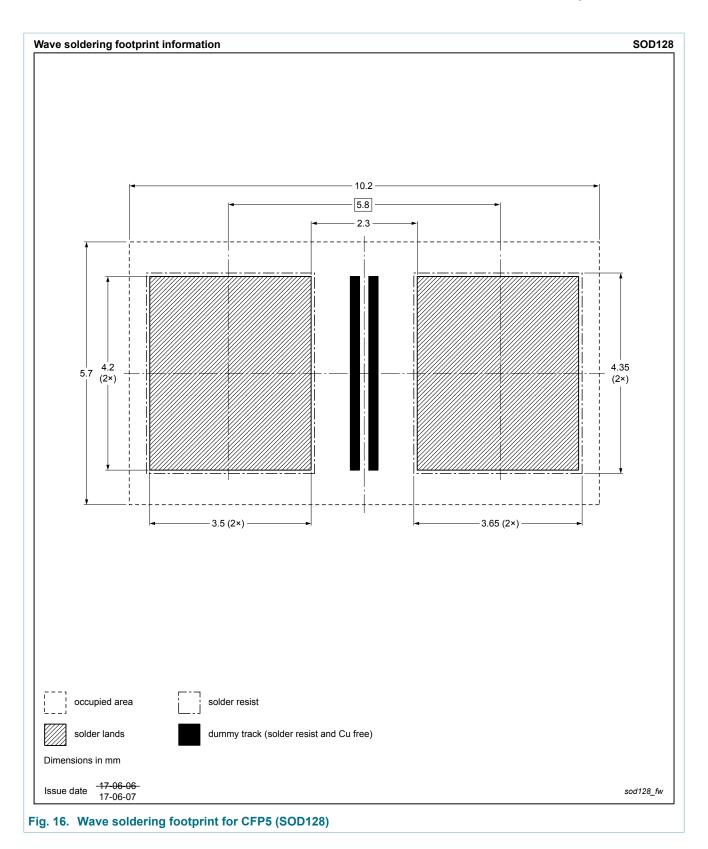
12. Package outline



13. Soldering



3 A low VF MEGA Schottky barrier rectifier



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3 A low VF MEGA Schottky barrier rectifier

14. Revision history

Table 8. Revision history

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Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG3030EP v.2	20180120	Product data sheet	-	PMEG3030EP
Modifications:		enefits: Capable for reflow a e soldering footprint added	nd wave soldering add	ed
PMEG3030EP _1	20091209	Product data sheet	-	-

3 A low VF MEGA Schottky barrier rectifier

15. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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3 A low VF MEGA Schottky barrier rectifier

16. Contents

1.	General description	1
2.	Features and benefits	1
3.	Applications	1
4.	Quick reference data	1
5.	Pinning information	2
6.	Ordering information	2
7.	Marking	2
8.	Limiting values	3
9.	Thermal characteristics	3
10.	. Characteristics	5
11.	. Test information	8
12.	. Package outline	9
13.	. Soldering	<u>9</u>
	. Revision history	
	Legal information	

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